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EXAMINER

LEUNG, JENNIFER A

ART UNIT PAPER NUMBER

1764

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/669,666

Applicant(s)

BEIERLE, FRED P.

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2006.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-28 is/are pending in the application.
4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 10-17 and 19-28 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☒ Claim(s) 1-17 and 19-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

29DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on August 18, 2006 has been received and carefully considered. Claims 1-9 are withdrawn from consideration. Claim 18 is cancelled. Claims 22-28 are newly added. Claims 10-17 and 19-28 are currently active.

Claim Objections

2. Claims 10-17 and 23-28 are objected to because of the following informalities:

In claim 10, line 15: "an upper layer (13)" should be changed to --the upper layer (13)--.

In claims 11-17, line 1: "An" should be changed to --The--.

In claim 16, line 7: "will will" should be changed to --will--.

In claim 23, line 1: "the" should be changed to --The--.

In claim 24, line 1: "the" should be changed to --The--.

In claim 25, line 1: "the should be changed to --The--, and "bimass" should be changed to --biomass--.

In claim 26, line 1: "the" should be changed to --The--, "ro" should be changed to --to--, and "clain" should be changed to --claim--.

In claim 27, line 1: "the" should be changed to --The--.

In claim 28, line 1: "the" should be changed to --The--, and "(T)f" should be changed to --of--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 10-17 and 19-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 10, it is unclear as to the relationship between the “upper layer (13), an intermediate layer (14), and a lower layer (15)” (line 11) and the “biomass” being supplied to the reaction chamber.

Regarding claim 11, it is unclear as to the added limitation Applicant is attempting to recite by, “the fuel conditioner means (100) contains fuel means (120)” (line 9) because said limitation has already been set forth in claim 10, lines 28-29. Furthermore, “the delivery means (16) *may include* hoppers, conveyors, augers and other such feed or delivery devices” (lines 14-15) is considered vague and indefinite, because it is unclear as to whether Applicant is attempting to recite a positive limitation, and it is unclear as to what other devices are considered within the scope of “other such feed or delivery devices”.

Regarding claim 12, it is unclear as to the relationship between “a heat exchanger water or fluid content (65)” and “a water or coolant reservoir (65)” set forth in claim 10, lines 22-23.

Regarding claim 14, it is unclear as to the added limitation Applicant is attempting to recite by, “bubble forming means (115) is provided by directing the fuel conditioner input means (110) via pipe or tube means (110) to and through the grid (116) formed of fine wire mesh or the plate with at least one aperture (117),” because said limitation has already been recited in claim 11, lines 9-13.

Regarding claim 15, it is unclear as to the added limitation Applicant is attempting to recite by “fuel means (120) comprised of diesel, peanut oil, vegetable oils and other combustible

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substances” because said limitation has already been recited in claim 13, lines 2-5.

Regarding claim 16, it is unclear as to the relationship of “a thermocouple at the top (31) of the reaction chamber (30)” and the thermocouple positioned at the upper layer (13) set forth in claim 13.

Regarding claim 17, “the reaction chamber (30) *may be* composed of heat and corrosion resistant materials” (lines 7-8) is considered vague and indefinite, because it is unclear as to whether Applicants are attempting to recite a positive limitation. Furthermore, the claim contains the trademark/trade name “inconel” (line 9). Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*, 218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a particular metal and, accordingly, the identification/description is indefinite.

Regarding claim 21, “the reaction chamber (30) *may be* composed of heat and corrosion resistant materials” (lines 8-9) is considered vague and indefinite, because it is unclear as to whether Applicants are attempting to recite a positive limitation. Furthermore, the claim contains the trademark/trade name “inconel” (line 10). Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. See *Ex parte Simpson*,

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218 USPQ 1020 (Bd. App. 1982). The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to identify/describe a particular metal and, accordingly, the identification/description is indefinite.

Regarding claim 22, it is unclear as to the structural relationship applicant is attempting to recite by, "a pump means positioned on said apparatus to produce fuel gas from biomass" (lines 24-25), because it is unclear as to which element of the apparatus the pump means is to be positioned on. Furthermore, "fuel conditioning means" (lines 22-23), "said heat exchanger means" (line 28) and "said initial storage point" (line 29) lack proper positive antecedent basis. Also, it is unclear as to where the "air" (line 26) is introduced into the apparatus.

Regarding claims 26-28, "said fuel means" lacks proper positive antecedent basis. Furthermore, "any combustible vegetable oil" and "any combustible, liquid fossil fuel" are considered vague and indefinite, because the use of the term "any" is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Patton (US 3,933,618) in view of Fetters et al. (US 4,530,702).

Regarding claims 22 and 23, Patton (FIG. 1; column 1, line 45 to column 9, line 5) discloses an apparatus comprising: a single reaction chamber (i.e., retort chamber 21) comprising a charcoal production bed (i.e., coal 39); a filter (i.e., chamber 40) functionally and physically connected to the reaction chamber 21 by pipe gas exit means (i.e., tube 32); said filter 40 being functionally connected to a heat exchanger (i.e., cooling coil 45, wash chamber 50); said heat exchanger comprising a heat exchanger tank 50 containing a coolant fluid (i.e., liquid 54, such as brine, which must inherently be supplied to the tank 50 via a coolant fluid inlet); a coolant fluid discharge (i.e., via valve 50.2); said heat exchanger discharge (i.e., to conduit 68) physically joining a demister element (i.e., condenser cooler 57 with collector tank 60) comprising a demister tank and a demister input, said demister input comprising at least one tube (i.e., cooling tubes 57.1) and a condensate drain (i.e., via conduit 66); a demister element output pipe (i.e., conduit 71) being functionally and physically connected to a fuel conditioner element (i.e., tank 46); said fuel conditioner element comprising a tank element 46, a bubble forming element (i.e., at the end of pipe 71; see FIG. 1) positioned near the bottom of the tank 46, a fuel fluid 47 and a fuel conditioning means discharge pipe (i.e., via line 72); a storage point (i.e., storage assembly 100); and a pump means 82 drawing air through the apparatus.

Patton discloses that instead of a reaction chamber 21 operating in batch, the apparatus may comprise a single reaction chamber (i.e., chamber 226 of retort 219; FIG. 5) that contains a charcoal production bed 239 and operates continuously, wherein the reaction chamber comprises a delivery means (i.e., feed conveyor 221) functionally connected to a source of biomass (i.e., coal source 238) and a charcoal removal system (i.e., discharge conveyor 222) comprising a mechanical conveyance means. It would have been obvious for one of ordinary skill in the art at

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the time the invention was made to provide a delivery means and a charcoal removal system to reaction chamber to enable continuous processing, as suggested by Patton. Also, it is within the level of ordinary skill to operate a process continuously. *In re Dilnot* 138 USPQ 248 (CCPA 1963); *In re Korpi* 73 USPQ 229 (CCPA 1947); *In re Lincoln* 53 USPQ 40 (CCPA 1942).

Patton also discloses a temperature sensing means (i.e., thermoelectric sensing element 31; FIG. 1) provided in the reaction chamber, but is silent as to the apparatus being configured such that the motor control for charcoal removal system is temperature-activated.

Fetters et al. (FIG. 2; column 7, lines 7-17) teaches a reaction chamber comprising a temperature sensing means 30, wherein the motor control for the charcoal removal system (i.e., for rotating an auger 32, not labeled in the figure) is temperature activated.

It would have been obvious for one of ordinary skill in the art at the time the invention was made to configure the motor control for the charcoal removal system in the apparatus of Patton to be temperature-activated, on the basis of suitability for the intended use, because such a configuration would allow for the automatic control of the reactor temperature and charcoal discharge, as taught by Fetters et al. Furthermore, the provision of mechanical or automated means to replace manual activity was held to have been obvious. *In re Venner* 120 USPQ 192 (CCPA 1958); *In re Rundell* 9 USPQ 220 (CCPA 1931).

Regarding claims 24 and 25, although Patton is silent as to the liquid 54 (FIG. 1) comprising a mixture of water and antifreeze, or a mixture of water and an alcohol, it would have been obvious for one of ordinary skill in the art at the time the invention was made to substitute other known, suitable coolants for the liquid 54 in the modified apparatus of Patton, on the basis of suitability for the intended use thereof, because the substitution of known equivalents involves

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only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958); *Ex parte Novak* 16 USPQ 2d 2041 (BPAI 1989); *In re Mostovych* 144 USPQ 38 (CCPA 1964); *In re Leshin* 125 USPQ 416 (CCPA 1960); *Graver Tank and Manufacturing Co. v. Linde Air Products Co.* 85 USPQ 328 (USSC 1950).

Response to Arguments

5. Applicant's arguments with respect to claims 10-17 and 19-28 have been considered but are moot in view of the new ground(s) of rejection, necessitated by amendment.

Allowable Subject Matter

6. Claims 26-28 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not disclose or adequately teach the instantly claimed apparatus further comprising the claimed fuel conditioner element, wherein the fuel conditioner element comprises a tank specifically containing a supply of diesel fuel, vegetable oil, or liquid fossil fuel, in which the cooled and demisted fuel gas generated by the reaction chamber is bubbled therethrough.

7. Regarding claims 10-17 and 19-21, the following claims drafted by the Examiner and considered to distinguish patentably over the art of record in this application, to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, and to provide further clarity to the claim limitations, are presented to Applicant for consideration:

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TO REPLACE CLAIM 10:

Claim 29 (New) An apparatus for the production of fuel gas and charcoal comprising:

a generally cylindrical reaction chamber (30) having an open top and containing a production bed (10), said production bed (10) comprising an upper layer (13) containing biomass input material, an intermediate layer (14) containing biomass that has been reduced to char and fuel gas (44) by pyrolysis, and a lower layer (15) containing biomass that has been further reduced to charcoal;

a delivery means (16) for supplying biomass to the upper layer (13) of the production bed (10);

a removal means (45) for removing charcoal from the lower layer (15) of the production bed (10);

a light detection means (22) mounted at the top (31) of the reaction chamber (30) for detecting the presence of biomass in the reaction chamber (30) and for signaling the supply of additional biomass to the upper layer (13) of the production bed (10) via said delivery means (16);

a temperature sensing means comprising at least one thermocouple positioned within the reaction chamber (30) for sensing the temperature of the production bed (10), said temperature sensing means further signaling the supply of additional biomass to the upper layer (13) of the production bed (10) via said delivery means (16) and the removal of charcoal from the lower layer (15) of the production bed (10) via said removal means (45);

an outlet means (43) for removing fuel gas (44) from the reaction chamber (30), said outlet means (43) being located on the reaction chamber (30) adjacent to the intermediate layer (14) of the production bed (10), said outlet means (43) being connected to a pump (42)

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for drawing atmospheric air through the open top of the reaction chamber (30), through the production bed (10), and into the outlet means (43);

a heat exchanger means (60) connected to said outlet means (43), said heat exchanger means (60) comprising a heat exchanger tank containing a water or coolant reservoir (65) for cooling the fuel gas (44), and said tank further comprising a heat exchanger exhaust (71) for discharging the cooled fuel gas (44);

a demister means (80) connected to the heat exchanger exhaust (71), said demister means (80) comprising a demister tank for collecting a condensate (83), at least one tube (81) for directing the cooled fuel gas (44) from the heat exchanger exhaust (71) into the demister tank, and a demister exhaust (82) for discharging the demisted and cooled fuel gas (44) from the demister tank;

a fuel conditioner means (100) connected to the demister exhaust (82), said fuel conditioner means (100) comprising a fuel conditioner tank containing a fuel means (120), a bubble forming means (115) for bubbling the demisted and cooled fuel gas (44) from the demister exhaust (82) into the fuel means (120), and a fuel conditioner exhaust for discharging the conditioned, demisted and cooled fuel gas (44) to a pump means (140);

and

a storage or engine means (160) connected to the fuel conditioner exhaust via said pump means (140) for collecting or combusting the conditioned, demisted and cooled fuel gas (44).

TO REPLACE CLAIM 11:

Claim 30 (New) The apparatus of claim 29, wherein,

the heat exchanger tank comprises a water or coolant inlet (67) and a water or coolant outlet (69),

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and the fuel gas (44) is bubbled through the water or coolant reservoir (65) and exhausted from the heat exchanger tank through the heat exchanger exhaust (71);

the at least one tube (81) of the demister means (80) extends downwardly toward the condensate (83) in the demister tank;

the bubble forming means (115) of the fuel conditioner means (100) is submerged beneath the surface of the fuel means (120) in the fuel conditioner tank, said bubble forming means comprising a pipe or tube means (110) that extends through a grid (116) formed of a wire mesh or plate containing at least one aperture (117);

the delivery means (16) comprises at least one device selected from the group consisting of hoppers, conveyors and augers;

the light detection means (22) comprises an electric eye, wherein the electric eye provides a switch function that electrically communicates with a motor drive for the delivery means (16), the motor drive being powered during a detected absence of biomass in the reaction chamber (30); and

the temperature sensing means comprises at least one thermocouple located at the upper layer (13) of the production bed (10).

TO REPLACE CLAIM 12:

Claim 31 (New) The apparatus of claim 30, wherein,

the heat exchanger means (60) further comprises a supplemental heat exchanger means (62) positioned within the heat exchanger tank and in fluid contact with the water or coolant reservoir (65);

the at least one tube (81) of the demister means (80) comprises a plurality of tubes, the demister

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means (80) further comprising a condensate drain means (84) comprising a valve and piping means for discharging the condensate (83) into a reservoir; and the delivery means (16) comprises a motor controlled auger.

TO REPLACE CLAIM 13:

Claim 32 (New) The apparatus of claim 31, further comprising:

valve means for controlling the supply of water or coolant to the inlet (67) and the discharge of water or coolant from the outlet (69);

wherein,

the supplemental heat exchanger means (62) comprises a tube heat exchanger;

the fuel means (120) comprises at least one combustible substance selected from the group consisting of diesel, peanut oil and vegetable oil; and

the temperature sensing means comprises three thermocouples positioned respectively in the upper layer (13) of the production bed (10), the intermediate layer (14) of the production bed (10), and at the delivery means (16).

CANCEL CLAIM 14.

CANCEL CLAIM 15.

TO REPLACE CLAIM 16:

Claim 33 (New) The apparatus of claim 32, wherein,

the conditioned, demisted and cooled fuel gas (44) is introduced directly into the intake manifold of the engine means (160);

the removal means (45) comprises a device selected from the group consisting of an auger, a valve controlled chute and a screw drive; and

the thermocouple positioned in the intermediate layer (14) of the production bed (10) signals the removal means (45) to move the intermediate layer (14) of the production bed down the reaction chamber (30); the thermocouple positioned in the upper layer (13) of the production bed (10) signals the safety shutdown of pump (42); and the thermocouple positioned at the delivery means (16) signals additional safety control of pump (42).

TO REPLACE CLAIM 17:

Claim 34 (New) The apparatus of claim 30, further comprising:
a reservoir collecting the water or coolant discharged from the heat exchanger means (60) via the water or coolant outlet (69) for subsequent agricultural use;
wherein,
the removal means (45) comprises a device selected from the group consisting of an auger, a valve controlled chute, a screw device and a lift or moving device, the removal means (45) further comprising a conveyance or routing means (34) and a charcoal storage means (36); and
the reaction chamber (30) is composed of heat and corrosion resistant materials including fiber-ceramic insulation and/or a stainless steel liner.

TO REPLACE CLAIM 19:

Claim 35 (New) The apparatus of claim 29, further comprising:
a funnel means (200) positioned at the top of the reaction chamber (30) for directing biomass to the center of the upper layer (12) of the production bed (10); and
a charcoal discharge funnel means (230) positioned between the lower layer (15) of the production bed (10) and the removal means (45), for directing charcoal away from the

walls of the reaction chamber (30) and toward the removal means (45);
wherein the funnel means (200) and the charcoal discharge funnel means (230) are sloped,
relative to vertical, at an angle greater than approximately 45 degrees.

TO REPLACE CLAIM 20:

Claim 36 (New) The apparatus of claim 35, wherein,
the funnel means (200) and the charcoal discharge funnel means (230) are sloped, relative to
vertical, at an angle of approximately 60 degrees; and
the removal means (45) comprises a device selected from the group consisting of an auger, a
valve controlled chute, a screw drive and a lift or moving device, said removal means
(45) further comprising conveyance or routing means (34) and a charcoal storage means
(36).

TO REPLACE CLAIM 21:

Claim 37 (New) The apparatus of claim 31, further comprising:
a charcoal collection means (41) and a charcoal heat exchanger means (260) comprising at least
one tube (262) that penetrates the wall (42) of the charcoal collection means (41) via a
plurality of heat exchanger ports (264);
wherein,
the uppermost portion of the reaction chamber (30) is slightly flared to accommodate a head of
the biomass; and
the reaction chamber (30) is composed of heat and corrosion resistant materials including fiber-
ceramic insulation and/or a stainless steel liner.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449. The examiner can normally be reached on 9:30 am - 5:30 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

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applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer A. Leung

October 28, 2006



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